Volunteer Lake Assessment Program Individual Lake Reports

EASTMAN POND, GRANTHAM, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	4,907	**Max. Depth (m):**	9.2	**Flushing Rate (yr^{1})**	2.1
Surface Area (Ac.):	335	**Mean Depth (m):**	3	**P Retention Coef:**	0.61
Shore Length (m):	4,000	**Volume (m^{3}):**	4,066,500	**Elevation (ft):**	1095

TROPHIC CLASSIFICATION

Year	Trophic class
1999	MESOTROPHIC
2009	MESOTROPHIC

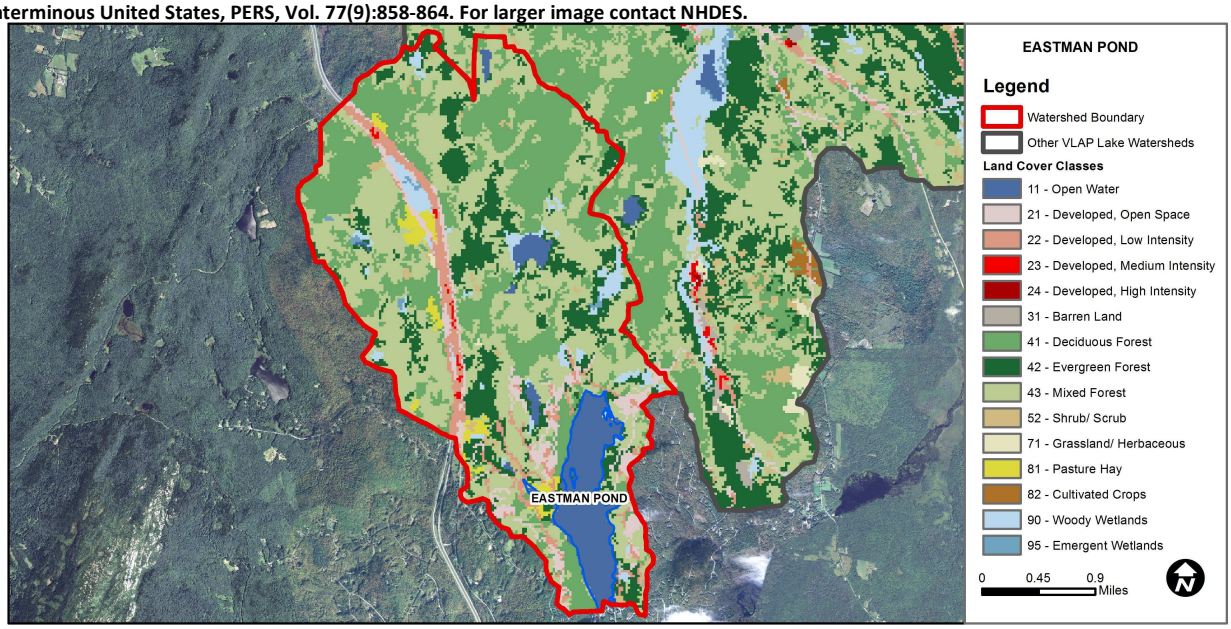
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Cautionary	< 10 samples and 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Slightly Bad	>5 samples and median is > threshold.
Primary Contact Recreation	E. coli	Good	Geometric means < criteria; however at least 1 exceedance of the single sample criteria occurred.
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	7.93	Barren Land	0.03	Grassland/Herbaceous	0.07
Developed-Open Space	5.02	Deciduous Forest	25.34	Pasture Hay	1.85
Developed-Low Intensity	4.45	Evergreen Forest	13.13	Cultivated Crops	0.01
Developed-Medium Intensity	0.22	Mixed Forest	37.64	Woody Wetlands	3
Developed-High Intensity	0	Shrub-Scrub	1.01	Emergent Wetlands	0.28

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
EASTMAN POND, GRANTHAM, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Average chlorophyll levels increased from 2012 and peaked in August. Above average precipitation in late spring/early summer and the resulting stormwater runoff may have contributed the nutrients necessary for the increased algal growth. However, historical trend analysis indicates a significantly decreasing (improving) chlorophyll level since monitoring began. We hope to see this continue!
- **CONDUCTIVITY/CHLORIDE:** Conductivity continues to be elevated at all stations except Anderson Pond. Chloride levels are particularly elevated in North Cove East and West Brooks and Tamari Brook. Although there are natural contributions to elevated conductivity in some tributaries; attention should be focused on those that also display elevated chloride levels. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity since monitoring began.
- **E. COLI:** E. coli levels at all stations were well below state standards for public beaches and surface waters.
- **TOTAL PHOSPHORUS:** Deep spot phosphorus levels were relatively low throughout the summer. Hypolimnetic phosphorus was slightly elevated in August along with the turbidity and was likely a result of low oxygen levels and release of phosphorus from bottom sediments. Historical trend analysis indicates a fairly stable trend with data varying moderately from year to year. Tributary phosphorus levels were low to average except for Anderson Pond and Northeast Bk. which experienced slightly elevated levels in July and August. Stroing Bk. experienced elevated phosphorus in June following a significant storm event.
- **TRANSPARENCY:** Transparency decreased slightly as the summer progressed with the increased algal growth. Historical trend analysis indicates relatively stable transparency with a moderate variation from year to year.
- **TURBIDITY:** Turbidity in Mill Pond Bk., Northeast Bk. and Tamari Bk. was elevated in August and/or September during low flow conditions. Monitors noted many tributaries had natural turbidity in September.
- **PH:** Hypolimnetic pH was below 6.5 units during each sampling event. Anderson Pond, Northeast Bk. and Stroing Bk. also experienced low pH throughout the summer.
- **RECOMMENDED ACTIONS:** Conductivity has significantly increased since monitoring began and enhanced conductivity and chloride monitoring should continue. Efforts should be made to reduce salt use in the watershed as well as identify impacts from water softener system discharge. Encourage road maintenance staff to obtain a Voluntary NH Salt Applicator license through the UNH Technology Transfer Center's (T2) Green SnoPro Certification Program. Keep up the great work implementing stormwater best management practices throughout the watershed!

Table 1. 2013 Average Water Quality Data for EASTMAN POND

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m NVS	Trans. m VS	Turb. ntu	pH
Anderson Pond				48.8		36			3.63	5.97
East Cove Beach					5					
East Lake Beach					2					
Eastman Brook Outlet				176.1	1	8			1.88	6.86
Epilimnion	9.63	5.48		167.3		8	2.96	3.21	1.39	6.60
Metalimnion				177.2		8			1.01	6.54
Hypolimnion				183.3		12			3.13	6.13
Mill Pond Brook				210.4		12			2.48	6.60
North Cove					2					
North Cove East Brook			110							
North Cove West Brook			210							
Northeast Brook			53	319.3		17			1.33	5.97
Northeast Brook Upstream			32							
S Cover Inner Harbor Bch					9					
South Cove Beach					0					
Stoney Bk at Robin Lane			24	231.9		8			1.15	6.84
Stoney Brook			47	367.3		9			1.33	6.90
Stroing Brook			10	96.1		15			0.55	6.02
Tamari Brook			280	886.0		9			5.29	6.63
West Cove A Beach					1					
West Cove B Beach					1					
West Cove C Lagoon			26							
Whiting Brook				611.0		13			0.87	6.55

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	Stable	Trend not significant; data highly variable.	Chlorophyll-a	Improving	Data significantly decreasing.
Conductivity	Degrading	Data significantly increasing.	Transparency	Stable	Trend not significant; data moderately variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.